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Legal systems include a wide variety of behavior-controlling laws. Violations of such laws are generally classified as torts (*e.g.*, noncriminal defamation), crimes (*e.g.*, drug offenses), or both torts and crimes (*e.g.*, battery and criminal fraud). Two principal aims of a legal system are the punishment and deterrence of those who commit crimes or torts (offenders), and the redress of injuries suffered by crime or tort victims. In attempting to redress injuries, legal systems create causes of action and establish courts to adjudicate the actions so that the victims themselves can seek peaceful redress. In attempting to punish and deter, legal systems rely upon "prosecutors" to bring actions against offenders.

For legal wrongs that are noncriminal, the "prosecutor" is the victim, and the method of prosecution is the action brought by the victim to seek redress. The offender is punished by being forced to reimburse the victim, and potential offenders are deterred by the possibility that the victims of any future offenses will bring actions against them. For wrongs that are criminal, the government prosecutes the offender in an action to punish the offender and deter the commission of future offenses. This action is generally separate from the action available to the victim, if any, to seek redress.[1]

This Note uses economic theory to reassess the division of prosecutorial tasks between victims and the government for offenses other than victimless offenses. It attempts to answer in a general manner questions such as why the prosecutor should differ from offense to offense and where the line should be drawn between governmental and individual prosecution. Work done in the areas of welfare economics and public finance concerning the effectiveness of government and the private sector in providing different sorts of goods is drawn upon heavily. This Note views prosecution as an economic good and a victim's prosecution of an offender as a market activity. First, it delineates an economic theory of prosecution and constructs two models for distinguishing offenses on the basis of their suitability for public prosecution or for public subsidy of individual prosecution. Then, the conclusions drawn from these models are employed to determine whether five common offenses are better suited for governmental rather than individual prosecution.

I. The Economic Theory

Welfare economics is a normative discipline that attempts to de-

1. This Note assumes that, as a general rule, all offenses currently prosecuted criminally by government could also be prosecuted by the victim. *But cf.* text at notes 16-19 *infra.*

termine in a detailed manner what improves social welfare in some sense. One might attempt to make such a determination by accurately comparing individual utilities. For example, one might consider whether, if *A* is forced to give a dollar to *B*, *B* has gained more than *A* has lost. Yet such comparisons are difficult to make. To avoid making them, most economic theory employs a criterion of optimality in social welfare that requires only those resource reallocations that improve the welfare of some individuals without impairing the welfare of others. An optimal position is reached when no action can be taken to improve the welfare of some individual without impairing the welfare of others. This criterion, called pareto optimality, is often the sole criterion of efficiency used by economists[2] and will be the sole one used in this Note.

It can easily be shown that a perfectly competitive market dealing in purely private goods is efficient by this criterion.[3] "Purely private goods" are goods, services, or activities that do not generate externalities. That is, they do not impose costs or benefits on those not involved in transactions concerning the "goods." When such costs or benefits are imposed, "externalities" are said to exist. For instance, external benefits arise when *A* pays someone to mow his lawn; his neighbors now live in a neater environment. External costs occur when *B*'s auto factory emits pollutants into the air; those living around the factory suffer breathing discomfort and long-term health problems. In each of these examples, costs or benefits arise that are external to the market transactions taking place.

A market in goods that generate externalities is generally inefficient according to the pareto-optimality criterion. This can be demonstrated by the auto factory example. Suppose that it would cost *B* $500 in lost profits to stop polluting by shutting down his factory and that the damage to the people living around the factory from the pollution totals $1000, $10 apiece for 100 people. The factory's continued production clearly is not pareto optimal. If the 100 people collectively paid a "bribe" of $500 to *B* to stop producing, *B*'s doing so would make them better off without detracting from his welfare.

The factory's production is nevertheless likely to continue, for the 100 people are not likely to organize and pay the bribe. Theoretically, each individual should be willing to contribute up to $10 for the bribe. The bribe might therefore be paid if some contribute more than $5, some contribute less than $5, and some contribute nothing. But, each individual in the group will realize both that his failure to contribute his share of the bribe will have little effect on whether the bribe is paid and that he will benefit the same amount

2. *See, e.g.*, J. HENDERSON & R. QUANDT, MICROECONOMIC THEORY 255-56 (2d ed. 1971).

3. *Id.* at 262-64.

regardless of whether and how much he pays. Many individuals will therefore attempt to become "free riders" by not contributing. It is likely that enough people will attempt to become free riders that the bribe will not be paid. A second reason why the bribe is unlikely to be paid is that significant costs would be incurred in organizing the group and attempting to compel each group member to contribute his share. This "transaction-costs" problem will have particular impact when the group is large or the amount sought from each contributor is small.

Thus, markets in goods that generate externalities are inefficient. Because the hypothetical pareto-optimal bribes that would result in the reduction or cessation of production will not occur, goods that generate external costs will be overproduced. By similar reasoning, goods that generate external benefits will be underproduced, since those who receive the external benefits are unlikely to bribe the producer to increase production:[4] If *A*'s neighbors could bribe him commensurate with their benefits, he would cut his lawn once a week; since they do not, he cuts it only once a month.

The obvious alternative to relying upon the market to achieve pareto optimality is governmental regulation. The government can compel payment by those who are benefited by an increase or decrease in the production of a good and can thus avoid the free-rider problem. Ideally, by taking into account the external benefits and costs generated by production, the government can make pareto-optimal decisions concerning the amount of a good that should be produced. But pareto-optimal decisions can be made only if people can signal their preferences to the government and the government can aggregate them and make unbiased production decisions. In a system of representative democracy, there are several reasons why this cannot occur with any substantial degree of accuracy. First, voters do not vote on individual issues, but rather express their preferences for candidates running on platforms of varying degrees of specificity. Votes are therefore, at best, signals as to a preferred package of issues and goods.[5] With decisions based upon such vague voting information, government-managed production may even satisfy individual preferences less accurately than an unregulated market. Second, as Professor Arrow has shown, the decision reached by a majority may arbitrarily depend on the order of voting on the alternative choices.[6] Strategic voting may therefore occur that results in deci-

4. *See* R. MUSGRAVE & P. MUSGRAVE, PUBLIC FINANCE IN THEORY AND PRACTICE 74-77 (1973).

5. *See id.* at 92-96.

6. Suppose we have three voters who are voting to choose one of three policies. If their preferences follow certain patterns, and if voting is done in sequential pairs with majority rule deciding, then the order of voting may determine which policy wins. Suppose voter *X* prefers policy *A* over policy *B* over policy *C*, voter *Y* prefers *C* to *A* to *B*, and voter *Z* prefers *B* to *C* to *A*. If a vote is taken on *A* versus *B*, *A* wins

sions that do not reflect voter preferences.[7] Finally, since it is impossible to tax individuals according to the level of benefits they receive from governmental spending, the provision of goods by the government will inevitably result in the redistribution of wealth.[8]

There are more imperfections resulting from government-managed production, but the above examples make the gist of the argument clear: Market imperfection does not necessarily argue for governmental provision because the governments have their own drawbacks. A decision whether an economic good should be provided by government, therefore, should be based on a weighing of the relative imperfections of the two sectors. Yet this weighing is not without difficulty. Questions like "How much are voter preferences distorted by representative democracy?" or "How much misallocation is there by the private sector?" cannot be answered quantitatively. Consequently, no clear-cut answer can be given when one asks whether the production level of any specific good should be established by the government.

When a question arises concerning the production of goods that are largely private but generate some external benefits and costs, it is often suggested that the appropriate policy is for the goods to be produced in the market, but for the government to subsidize the producer to the extent of the external benefits and tax the producer to the extent of the external costs. If this were done, our polluting factory owner would be taxed $1000; he would then shut down the plant, and the efficient solution would be achieved.[9] But this approach suffers from the same kinds of problems that render total government production infeasible. Both approaches are viable only if individuals can provide signals as to the external costs and benefits felt by them and only if the government can aggregate and implement these signals in an unbiased manner. Thus, this approach provides no automatic solution to the dilemma.

Where does this leave us? The failures of economic theory do not make legislators and administrators stop in their tracks. Life

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and then *C* prevails over *A*, so *C* is the policy chosen. But if we start with *B* versus *C*, *B* wins, and then *A* wins over *B*, so *A* is the winner. Something as trivial and arbitrary as voting order has determined the policy chosen. *See generally* K. ARROW, SOCIAL CHOICE AND INDIVIDUAL VALUES 2-3 (1951).

7. *See* R. MUSGRAVE & P. MUSGRAVE, *supra* note 4, at 92.

8. This last problem results from the nature of taxation rather than from any defects in representative democracy. Suppose there are three taxpayers who benefit from government spending by $3, $4 and $5 respectively. As long as each individual's tax burden does not match his benefits from governmental spending, income will be redistributed. If taxes are greater than benefits, one loses; if less, one wins. Such redistribution is an analytical problem rather than a practical one. While some particular redistributions may be desired, characterizations of one situation as better than another in the pareto-optimal sense is impossible if wealth is distributed differently in the two situations. *See id.* at 83-108.

9. *See generally id.* at 75-76.

(and government) goes on, educated guesses are made, and theory is used to fill in the gaps in empirical knowledge.

This Note attempts some filling in. Two models are developed in an effort to compare different goods—the prosecution of different offenses—according to their suitability for governmental provision and for governmental subsidies to aid private provision. The prosecution of an offense can profitably be viewed as an economic good because, whether or not successful, it generates benefits and costs for the prosecutor, the offender, and third parties. These models will isolate factors that influence an offense's suitability for governmental prosecution. While absolute prescriptions as to the mode of prosecution for any particular offense are not and cannot be made, the use of models allows for the ranking of offenses according to their relative suitability for governmental or private prosecution.

Before constructing the models, two objections to the use of economic theory for this purpose must be considered. One objection is that this use of economic theory assumes that offenders are "economic men." Economic theory studies individuals who are by hypothesis rational maximizers of their welfare, individuals who weigh costs and benefits before acting. For the models developed below to yield fruitful results, however, it is not necessary that offenders be *completely* rational maximizers. Indeed, the extent to which offenders match or diverge from the "economic man" notion is a key variable in one of the models. The models do assume, however, that even criminals weigh costs and benefits to some degree before acting and are thus deterred by the prospects of punishment or penalty. If this is not true, economic analysis is of no use.

Whether criminal penalties have a deterrent effect has in the past been a matter of some controversy,[10] but recent literature offers a clear conclusion. The work of Andenaes is anecdotal and its aims limited, but it argues convincingly that at least some deterrence exists.[11] His stories of wild outbreaks of criminal behavior during police strikes,[12] for instance, make the deterrence hypothesis hard to refute. The works of Ehrlich and Philips use sophisticated econometric techniques to measure deterrence effects and find some present.[13] Ehrlich, using cross-sectional data from different states,

10. Some writers have argued that a large number of criminals are neurotic and that punishment of offenders therefore has little deterrent effect. *See, e.g.*, F. ALEXANDER & H. STAUB, THE CRIMINAL, THE JUDGE AND THE PUBLIC 207-09 (1931). Eysenck says that "it is doubtful whether punishment acts as a very effective deterrent." H. EYSENCK, CRIME & PERSONALITY 157 (1964). Zimring and Hawkins believe in the existence of deterrence, but not for all persons in all situations. They conclude, for instance, that "anti-authoritarian" personalities may view a new threat as an invitation to defiance. F. ZIMRING & G. HAWKINS, DETERRENCE 123-25 (2d ed. 1973).

11. *See* J. ANDENAES, PUNISHMENT AND DETERRENCE (1974).

12. *Id.* at 17, 50-51.

13. Ehrlich, *The Deterrent Effect of Criminal Law Enforcement*, 1 J. LEGAL

found significant correlation between the probability and severity of punishment on the one hand and the rate of FBI index crimes on the other.[14] Given such evidence, one can safely presume that criminals are at least minimally deterred by punishment and thus are at least minimally rational.

The second objection to this use of economic theory is that prosecution of offenders can be viewed as a market activity only if there is a possibility of private gain when prosecution is performed by private individuals. To meet this objection, it is assumed that the victim who brings an action to punish and deter can, in the same action, recover damages for the offense. In order to facilitate the comparison of private and governmental prosecution, it is also assumed that, if a governmental action is brought, the government will recover and remit to the victim money damages for injuries suffered by the victim. Finally, it is assumed that, in either case, the court adjudicating the action can impose a fine or prison term on the offender if appropriate.[15]

II. A Model for Offenses Characterized by the Evidentiary Problem

The two models presented in this and the next section assess the suitability of offenses for governmental prosecution. The first is simple, unsurprising, and justifies, on economic grounds, governmental prosecution of the core offenses of the criminal law. The second model, more complex, analyzes the remaining criminal and tort offenses and suggests a few changes in policy. The easy job is undertaken first.

Certain offenses are characterized by what may be called the evidentiary problem; that is, the offender's identity is often difficult to discover unless the offender is apprehended at the scene of the offense, and the details of the crime's commission cannot be determined through the use of ordinary civil discovery and investigative techniques. Some activities that are prosecuted by the government as crimes—homicide and larceny, for example—involve the evidentiary problem. Some crimes, such as perjury, do not. Most offenses

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Stud. 259 (1972); Phillips, *Crime Control: The Case for Deterrence*, in S. Rottenburg, The Economics of Crime and Punishment 65-84 (1973).

14. Ehrlich, *supra* note 13.

15. These assumptions are necessary to isolate the variables that are of concern in this Note. An offense for which imprisonment is a particularly appropriate punishment is better suited for governmental rather than private prosecution. *See* text following note 20 *infra*; note 26 *infra*. On the effect of fines, see notes 22, 26 *infra*. The compensation of victims by the government is assumed in order to facilitate comparisons and because such compensation seems an appropriate and feasible goal of government. Accordingly, to distinguish governmental and private prosecution on the ground that victims are only compensated in the latter situation is improper: The analysis used in this Note should not be affected by what is probably a historical accident.

that are solely torts and that currently are prosecuted privately, such as products liability, defamation, misrepresentation, landowners' negligence, and most auto accidents, also do not. As demonstrated below, the presence of the evidentiary problem justifies public provision of police[16] and consequently makes governmental prosecution suitable for offenses characterized by the problem.

The significance of an offense characterized by the evidentiary problem (EP offense) is that investigators who are capable of using force are often needed immediately after such an offense has been committed in order both to effect the immediate apprehension necessary to make prosecution possible and to investigate the details of the offense. The functions of these investigators, or police, are such that private agents could not perform them without generating substantial external benefits and other sources of market imperfections.

Suppose that a private company, called upon to prevent EP offenses, provides "police services" for a fee to 250 houses out of a 500-house neighborhood. To be able to arrive quickly at the scene of a crime, the private policemen need to circle the area in patrol cars. In so doing, they benefit the 250 nonsubscribers. The criminal, seeing a patrol car, does not know which houses belong to subscribers and which do not and is therefore deterred from committing crimes against nonsubscribers. Also, the private policemen at times apprehend criminals who have robbed homes of nonsubscribers, both out of public-spiritedness and on the theory that the criminal's apprehension helps subscribers since the criminal might strike in the neighborhood again. This practice also deters the commission of offenses at nonsubscribing houses.

It is thus clear that the private provision of police services to prevent EP offenses in a geographic area generates external benefits for those in the area who choose not to help support the police. Because these benefits would not be reflected in the market price of police services, the "production" of police services would be less than optimal. This market imperfection means that a better case can be made for governmental prosecution of offenses characterized by the evidentiary problem than for governmental prosecution of other offenses.

In several respects, the nature of the costs of police services provides additional support for governmental provision. Private police must be able to distinguish between calls for aid from subscribers and nonsubscribers. This must be done quickly if the police are to operate effectively. This could be done by the installation, in sub-

16. To be more accurate, a better case can be made for public police to deal with offenses characterized by the evidentiary problem than can be made for public police to deal with other offenses. As noted in the text at notes 5-8 *supra*, the inability to quantify governmental misallocation renders it impossible to make any absolute statements concerning the feasibility of governmental provision of police.

scribers' homes, of communication devices connected to the private police office, but such devices are costly. Similar methods of distinguishing subscribers from nonsubscribers would also be costly.[17] In short, private police companies, investigating EP offenses, face costs of excluding nonsubscribers from using their services, costs that would not be incurred by public police forces.[18] Moreover, the police protection industry is a "natural monopoly" for a given geographic region because it faces decreasing or even zero marginal costs for servicing additional customers within the region. A patrol car circling a neighborhood and servicing some of the homes within the neighborhood could service other homes at virtually no additional cost. If two police firms each have a squad car patrolling the area, inefficiencies result. A more efficient system is for one firm to service the area so that it can direct one squad car to service the entire area, or, if necessary, two cars to service half the area (or half of a slightly larger area) each. The existence of these economies of scale makes monopoly "natural" for a particular area. Yet, if a firm establishes a monopoly, it may well exploit its position to achieve exorbitant profits. It is for this reason that natural monopolies, like the police protection industry, traditionally are and should be government-run or government-regulated.[19]

Two other factors militate in favor of public police. One factor is that many of the offenses that present the evidentiary problem often require the use of force for apprehension. For noneconomic reasons, it might be desirable to restrict the use of force as much as possible to agents of the state. The other factor is that investigators might gain the cooperation of witnesses more readily if they are public rather than private investigators.

In sum, there are economic and noneconomic reasons why government should provide police protection services and, consequently, why offenses characterized by the evidentiary problem should be investigated by government agents. Theoretically, public police could investigate such offenses and, upon apprehending the offender and learning the details of the offense, turn over the information gathered to the victim. The victim could retain a lawyer to prosecute the offense and perhaps to investigate the offense further and interrogate the police about their actions.

But there are problems with separating the investigative and prosecutorial tasks associated with a particular offense. Some prob-

17. Subscribing houses could be identified with stickers, but counterfeiting might be a problem and the use of stickers might be viewed as irresponsible—as an incitement to crime against nonsubscribers. The cost of producing, distributing, and applying stickers would still be a "cost of exclusion."

18. *See generally* R. MUSGRAVE & P. MUSGRAVE, *supra* note 4, at 53.

19. *See generally* W. SHEPERD, PUBLIC POLICIES TOWARD BUSINESS 342-48 (1975).

lems are purely practical. For example, juggling the schedules of police officers so that they can testify at trials is more easily accomplished by a public prosecutor in daily contact with police officials. Similarly, some central office is needed to select the offenses on which the police should expend their limited investigative time since individual victims, to whom the police services would presumably be costless, would direct the police to engage in a major investigation each time. Moreover, coordination problems would arise if the police were required to take orders from different individuals each day.

One problem with separating the investigative and prosecutorial tasks is considerably more fundamental than these practical considerations. Since government activities are not run on the profit motive, noneconomic incentives are necessary to maintain the morale of government personnel. In particular, police presumably must feel that their work will result in the attainment of justice.[20] If the prosecution function is left to private individuals, police might believe that they are working only to enrich private lawyers and that the discretionary decision to prosecute criminals will be made on grounds unrelated to justice. The fact that police must feel that they are serving a public function, rather than merely aiding market activities, is a persuasive reason for governmental prosecution of offenses that pose the evidentiary problem.

The conclusion of this first economic model is that EP offenses, which are by and large the "core" offenses of the criminal law, are the best cases for governmental prosecution. This conclusion is supported by a few practical considerations. Of all offenders, those who commit core offenses are perhaps most likely to be indigent. Many victims will be unwilling to prosecute indigent offenders unless subsidized by the government for the costs of prosecution because any damage judgment in their favor would be uncollectible. But, in subsidizing victims, the government in effect must decide which offenders should be prosecuted and must pay for the prosecution. It might well be more economical for the government to prosecute offenders directly rather than to do so indirectly by subsidizing victims. Moreover, society may determine that, of all offenders, those who commit EP offenses are most in need of receiving prison terms rather than some other form of punishment. Because offenders who are imprisoned are likely to be unable to satisfy damage judgments entered against them, governmental subsidy of private prosecution and, hence, governmental prosecution itself, may be required for offenses committed by offenders who are apt to be imprisoned.

III. A Model for Other Crimes and Torts

The model set forth above explains in a general manner why

20. *See generally* McDowell, *Police as Victims of Their Own Misconceptions*, 62 J. Crim. L. 430, 432 (1971).

offenses characterized by the evidentiary problem are the most appropriate offenses for public rather than private prosecution. The second model deals with the remaining crimes and torts in a more complex manner. The model has two parts. The first examines the determinants of the ratio of private to external benefits from private prosecution in order to assess the degree to which the free market errs in allocating resources to the prosecution of various offenses. The first part shows that market error is greatest for offenses the prosecution of which gives rise to the greatest net external benefits relative to net private benefits. It also shows that net external benefits are greatest for offenses that are deterred the most by the prosecution of offenders. The second part assesses the degree to which the government errs in allocating resources to the prosecution of various offenses. It demonstrates that the moral stigma associated with the offense and the political influence of the offender relative to the political influence of the victim affect governmental error. These findings are then employed to determine the relative appropriateness of governmental prosecution for certain offenses.

At the outset, it must be established that the amount of market error in providing a good varies with the relative weight of the external benefits to the private benefits generated by the good. This proposition can be demonstrated by the following table (all benefit figures are net of costs):

Q	B_a	B_{e1}	B_{e2}	B_{t1}	B_{t2}
2	12	3	6	15	18
4	10	2	5	12	15
6	8	1	4	9	12

The numbers in columns B_a through B_{t2} represent quantitatively the benefits generated per unit of some good at quantities 2, 4, and 6 of that good. In particular, the numbers in column B_a represent the benefits per unit of the good received by party *A*, the consumer of the good; the numbers in column B_{e1} are the external benefits per unit resulting from the production of the good according to one measure of external benefits; the numbers in column B_{e2} are the external benefits per unit resulting from the production of the good according to a second measure of external benefits. The last two columns are benefit totals. B_{t1} is derived by adding the quantities in B_a and B_{e1}. B_{t2} is the sum of B_a and B_{e2}.

Where the per unit external benefits generated by the production of the good equal the quantities set forth in column B_{e1}, consumer *A*, in an optimal setting, will be willing to pay for the good at the B_{t1} schedule, since those receiving the external benefits will bribe him to do so. But, as noted above,[21] the existence of the free-

21. *See* text at notes 3-4 *supra*.

rider and transaction-costs problems will lead him to be willing to pay only at the B_a schedule. Thus, consumer *A* will be willing to pay only 12 per unit for a quantity of 2 units when in an optimal situation he would be willing to pay 15.

Suppose the market price of the good equals 12. Because *A* is willing to buy 2 units at the price of 12 per unit, he will demand 2 units of the good. If the external benefits equaled the B_{e1} schedule and an optimal situation existed, however, consumer *A* would have demanded 4 units at a market price of 12 per unit. Because of market imperfections, therefore, only half the optimal amount is produced. Alternatively, if external benefits equal the B_{e2} schedule, actual demand will still be determined by the B_a schedule, but optimal demand will be determined by the B_{t2} schedule. Optimally, *A* will demand 6 units at a market price of 12 per unit whereas actually he will demand only 2 units. Thus, at external benefits equal to B_{e2} and a market price of 12, only one third of the optimal amount is produced.

The results for a market price of 12 are summarized in the following table:

	Optimal Production/Actual Production
$B_a/B_{e1} = 12/3$	4/2
$B_a/B_{e2} = 12/6$	6/2

This table illustrates what should be intuitively obvious. As the external benefits rise relative to the private benefits (from 12/3 to 12/6), the actual production of the good deviates more from the optimal production (from 4/2 to 6/2), and thus the market error in failing to allocate resources to the production of the good increases. Alternatively, and more significantly, it can be said that, for two goods that render the same amount of benefits per unit to consumer *A* at a given quantity (that is, they have the same B_a schedule), there will be less underproduction of the good that generates external benefits at the B_{e1} schedule than of the good that generates external benefits at the B_{e2} schedule. Thus, the relative efficiency of the market in producing various goods can be determined by comparing the ratio of private benefits to external benefits (B_p/B_e) of the goods. The higher the B_p/B_e ratio, the more accurately the market allocates resources to the production of the good.[22]

22. A more general formulation is easy to develop. Let f_1 be private demand and f_2 external benefits. Let both of them be functions of price, with the resulting values being quantities. Thus $f_1(p^0) = q^0$, $f_2(p^0) = q^1$. The optimal equilibrium quantity will be $f_1(p^0) + f_2(p^0) = q^0 + q^1 = q^2$; but the actual quantity will be only q^0. Thus, actual/optimal $= q^0/q^2 = f_1(p^0)/[f_1(p^0) + f_2(p^0)]$. Now, we can define a function g such that $f_1 = g(f_2)$. Then, actual/optimal $= g(f_2)/(g(f_2) + f_2)$. Plainly, as g gets larger, the fraction gets nearer to 1. Thus, as f_1 gets larger relative to f_2, the actual quantity bought gets nearer to the optimal quanity.

The remainder of this section attempts to describe the determinants of the B_p/B_e ratio for specific goods—the prosecution of various offenses—and thus attempts to determine the relative market efficiency in allocating resources to the prosecution of the offenses. It hypothesizes that *all* offenses, both torts and crimes, are prosecuted in the market—that is, by the victim of the offense. The method of analysis employed entails several assumptions.[23] First, it assumes that the victim can recover actual but not punitive damages in all prosecution actions. Second, it assumes that successful prosecutions generate net external benefits for the victim and society, which is true so long as the behavior-controlling laws are just and prosecutions are successful only when the defendant has in fact committed the offense alleged.[24] Finally, it assumes that society has benefited $X when an offender has compensated his victim $X, which requires that an offender's enjoyment of his ill-gotten gains be viewed as having no societal value.[25] The analysis views victim-

23. These assumptions may be oversimplifications, but they are necessary to keep the discussion within reasonable bounds. In large measure, they should be "correct"; that is, the empirical ones describe existing facts correctly and the ethical ones express attitudes that are widely held.

24. Complications ensue when one drops the assumption that every successful prosecution is factually proper. The result is that a private action might be either beneficial or costly to society with respect to both private and external factors. The damages won are a social benefit if plaintiff is right and a cost if he is wrong. The external effects are more complicated. External benefits in the form of deterring offenders will occur whether or not plaintiff was right because, first, potential offenders will not know whether plaintiff was right and, second, even if plaintiff was wrong, a judgment for plaintiff still suggests that successful prosecution of a given offender is more likely than before. External costs are generated in so far as frivolous, yet potentially victorious, suits are encouraged by a plaintiff's improper success.

25. There are several ways to vary this assumption. One can assume that, while losses to victims are social costs, gains to offenders can in part be social benefits. If so, a "transfer offense" like theft will present social costs in the amount of the victim's loss minus f times the offender's gain, where f is a fraction between 0 and 1. This will result in generally lower social costs from transfer offenses and will entail a policy of less spending to combat these offenses than will be the case under the assumption used in the text.

Alternatively one can assume the same kind of cost-offset as above but hypothesize that there is another element of social cost: whenever an offense is committed there are "injustice costs" to society. If "injustice costs" are constant over all offenses, this assumption will entail no changes in policy, but, if they vary, then there will be more spending on the more unjust offenses.

Another approach is the more thoroughgoing utilitarian one of assuming that transfers are good to the extent that total utility is increased. If one accepts the plausible thesis that the marginal utility of money diminishes with wealth, then thefts from the rich by the poor may provide net social benefits (although total utility can also include increasing people's feelings of safety). This approach thus entails separating transfer offenses by the wealth of the average offender and the average victim. Prosecution is most desirable where the offender is wealthier than the victim and perhaps unjustified if the offender is poorer than the victim. Using this approach, deterrence may result in external costs as well as benefits, since a prosecution may deter poor offenders from acting against rich victims. In short, alterations in the assumption made in the text can significantly alter the conclusion of the analysis.

compensation and deterrence as the goals of a prosecution. While the analysis does not consider the goal of retribution, the model developed can apply without alteration to a legal system that places significant emphasis on that goal.[26]

The B_p/B_e ratio is the ratio of net private to net external benefits that would result if, for the average offense, the victim brought or tried to bring an action against the offender. "Bringing an action" includes everything from initial settlement discussion to actual trial of the prosecution. "Net private benefits" (B_p) to an average individual from bringing an action is a function of the probability of success, the various gross benefit determinants, and the various cost determinants. This quantity can be represented as follows:

$$B(P_{si}, D, C_L, x_1 \ldots x_n, \ldots y_1 \ldots y_n)$$

P_{si}, with i varying from 1 through n, is the schedule of probabilities of success[27] at various levels, levels 1 through n, of "bringing the action." It is clear that the chances of success will vary with the level to which the action is pursued, and thus with the amount of resources committed to the action by the victim. Presumably, the victim will

26. The method of analysis used here need not be altered significantly if one concludes, as many have, *see, e.g.*, H.L.A. HART, PUNISHMENT AND RESPONSIBILITY 231 (1968), that retribution requires the punishment of those who commit immoral offenses. Because immoral offenses are generally crimes and morally neutral offenses are generally torts, adherence to such a view appears at first blush to support the present crime/tort distinction that separates governmental and private prosecution. The implications of the retributive theory, however, are not so simple, but rather must be uncovered by asking what the retributive theory demands. Hart argues that one key ramification of the retributive theory is that the severity of the punishment must vary with the gravity of the offense. *Id.* This ramification does not necessarily alter the analysis employed in the text since the court adjudicating a prosecution can increase the severity of the punishment by imposing a fine, whether or not prosecution is by the government. If uniform fines are viewed as unfair in the sense that they burden the poor convicted offender more than the rich one, fines could be tailored according to the income and wealth of the offender in the manner of a progressive income tax. The imposition of fines in this manner would require a change in the model developed in this Note, since B_p/B_e would be larger for offenses with relatively wealthier offenders. Presumably such a change would be required only where offenders are individuals rather than corporations. It is of course not at all clear that uniform fines for a particular offense are unfair, since each offender, regardless of income, profits the same from committing an offense.

If imprisonment is considered necessary to satisfy the goal of retribution, governmental action of some sort probably will be necessary to increase private prosecution to the optimal level. This is true since private plaintiffs may be reluctant to prosecute an offender who will be imprisoned and will be therefore unlikely to satisfy a damage judgment entered against him. No alteration in the model developed in the text is necessary if imprisonment is deemed appropriate only for violations of offenses characterized by the evidentiary problem. *See* text following note 16 *supra.*

In discussing retribution, Hart also mentions the "reprobative theory," *id.* at 235, the theory that retribution *by the state* performs an act of authoritative moral condemnation and that this state condemnation is important, either morally or as a means of deterrence. This theory does not necessarily require alteration of the model since the state condemns *all* offenses through the rulings of judges and through state enforcement and execution of the rulings.

27. "Success" is used to mean the recovery of full damages.

actually commit to the action that amount of resources that optimizes his return.[28] D is the amount of damages inflicted on the victim. C_L represents the schedule of litigation costs and takes into account the fact that litigation costs will vary with the level to which an action is pursued. Finally, "$x_1 \ldots x_n$" are other determinants of gross benefits and "$y_1 \ldots y_n$" are other determinants of costs. These dummy variables could be replaced by more specific ones, but will not be so replaced because greater detail in the theory will not yield any fruitful implications.

The "net external benefits" (B_e) resulting from an action are derived by analyzing the deterrent effect of the action. The prosecution of an offender imposes some costs on the offender, whether or not the prosecution is successful, and should thus change his estimate of the probable costs and benefits from the commission of future offenses.[29] The offender will view future offenses as at least slightly less profitable than if no action had been brought simply because his estimates of the likelihood that future actions will be brought will depend on his past experiences. Similarly, other potential offenders will be affected to some small degree by the action since some of them will be aware of the action and will consider it in weighing the possible costs associated with the commission of future offenses. Put very simply, offenders will be deterred by the action. They will commit fewer offenses and thus will inflict less damage on third parties. This avoided damage can be viewed as the external benefits resulting from the prosecution.[30]

The quantification of these external benefits can profitably begin with an analysis of the net damage caused by an average offense. Net damage is, in general, the actual damage inflicted upon the average victim less the amount of the average victim's actual damage recovery. The average victim's damage recovery in turn depends upon the probability that the victim will bring an action and the average damage recovery when an action is brought. Net damage can therefore be quantified as follows:

$$D\text{-}P_j\,[B'\,(P'_{si},\ D,\ C_L,\ x_1 \ldots x_n,\ y_1 \ldots y_n)]$$

D is the actual damage inflicted upon the average victim. P_j is the probability that the victim will bring an action. The B′ function, which is similar to but differs in significant ways from the B function,

28. That is, the amount of resources expended is the amount that minimizes a loss function for the plaintiff, which function depends on the amount of damages in the case, the plaintiff's chances of recovering, and the costs of recovering.

29. Offenders may be able to insure themselves against liability. Such a practice would change somewhat the costs incurred by offenders who lose suits, but not the general pattern of those costs. If an offender commits an offense in period t and is prosecuted, his insurance premiums in period $t + 1$ will cost him more.

30. Landes and Posner appear to realize that there can be externalities from deterrence, but do not take the point any further. *See* Landes & Posner, *The Private Enforcement of Law*, 4 J. LEGAL STUD. 29 (1975).

is the average expected benefits that result *in actions that are actually brought.* B′ is a function of P'_{si}, the probability of success *in actions that are actually brought,* and of D, the victims' damages, C_L, the litigation costs, "$x_1 \ldots x_n$," the various benefit determinants, and "$y_1 \ldots y_n$," the cost determinants. B′ differs from B in that B is the average benefits that would result if an action were brought for every offense. To phrase it differently, B is the benefits that the average victim can expect to recover, with the averaging process including not only instances where an action has some likelihood of success, but also instances where the action is likely to result in a net cost to the victim. P_jB' (. . .) is the average net recovery by the victim for each offense and is obtained in effect by multiplying the average recovery in cases actually brought by the likelihood that an action will be brought. P_jB' (. . .) will be greater than or equal to B, assuming that victims bring actions when it is profitable to do so, because the averaging undertaken to determine P_jB' (. . .) excludes actions that would be unprofitable to the victim.[31]

The next step in quantifying the external benefits is to analyze the deterrent effect of an action, that is, the diminution, caused by the prosecution, in the probability that offenders will commit offenses.[32] An action deters both the offender against whom the action is brought (special deterrence) and other potential offenders (general deterrence). The amount of deterrence turns on whether the action is successful, although, because the defendant must expend resources to defend any action, some deterrence occurs even if the action is unsuccessful. Special deterrence can be quantitified as follows:

$$P_{si}\ P_{dli} + (1\text{-}P_{si})\ P_{d3i}$$

As above, P_{si}, for i equals 1 through n, is the probability of success schedule *for actions brought for every case.* P_{dli} is the change in the likelihood that the defendant will discontinue offending that results from a successful action brought against him. Because of the

31. The following example elucidates the distinction between B and P_jB' (. . .). Assume that 10 offenses occur. If actions are brought to redress 2 of the offenses and $10 are recovered in each, P_j is 2/10, B′ is $10, and P_jB'(. . .) is $2. Assume that, if the eight remaining offenses had been prosecuted, $5 would have been recovered in one, $5 would have been lost in each of five, and $10 would have been lost in each of two. B therefore is the total benefits and costs from the prosecutions, $(20), divided by the number of offenses, 10, for a result of $(2).

32. A subtle distinction must be made to understand the deterrence factor. The P_a variable measures not the absolute deterrability of an offender, but rather the offender's response to increases in costs of offending; it measures incremental rather than total deterrence. On the basis of his life experiences, *A* may be more deterred by the general specter of law enforcement than *B*, but *B* may be more affected by a change in the amount of law enforcement. *B* possesses a higher value for P_a. Put another way, if Y equals aX plus b, where Y is the amount of deterrence and X the amount of law enforcement, here we are interested in a, the slope of the line, not in b, the intercept.

variance of the costs of litigation and of the probable damage recovery, P_{dli} varies (from i equals 1 through n) with the level to which the action is pursued by the victim before it is successful. $(1\text{-}P_{si})$ is, of course, the probability that the action will be unsuccessful, and P_{d3i} is the change in the likelihood that the defendant will discontinue offending that results from an unsuccessful action, with both figures varying from i equals 1 through n according to the level to which the action is pursued before the victim concludes that it is unsuccessful. In short, special deterrence is the sum of the deterrent effect of a successful action times the probability that the action will be successful and the deterrent effect of an unsuccessful action times the probability that the action will be unsuccessful.

The amount of general deterrence can be derived similarly. Each potential offender is deterred as follows:

$$P_{si}\ P_{d2i} + (1\text{-}P_{si})\ P_{d4i}$$

This quantification is the same as the quantification of special deterrence except that P_{d2i} and P_{d4i} refer to the deterrence of offenders other than the defendant that results from successful and unsuccessful prosecutions respectively. Total general deterrence is therefore

$$K\ [P_{si}\ P_{d2i} + (1\text{-}P_{si})\ P_{d4i}]$$

where K is the total number of potential offenders. The sum of the specific and general deterrence is the total deterrent effect of the action:

$$[P_{si}\ P_{dli} + (1\text{-}P_{si})\ P_{d3i}] + K\ [P_{si}\ P_{d2i} + (1\text{-}P_{si})\ P_{d4i}]$$

This can be simplified algebraically to:

$$P_{si}\,(P_{dli} + KP_{d2i}) + (1\text{-}P_{si})\ (P_{d3i} + KP_{d4i})$$

It is at this point possible to quantify the net external benefits flowing from an action. The only additional factor that must be added is N, the number of future offenses that the average potential offender was likely to commit before the action at issue was brought. Total net external benefits (B_e) are therefore:

$$[P_{si}\ (P_{dli} + KP_{d2i}) + (1\text{-}P_{si})\ (P_{d3i} + KP_{d4i})]$$
$$N[D\text{-}P_j\ B'\ (P'_{si},\ D,\ C_L,\ x_1 \ldots x_n,\ y_1 \ldots y_n)]$$

These quantitative formulations of B_p and B_e can be employed to determine what factors influence the B_p/B_e ratio, and thus market efficiency. All the "P" variables—P_{si}, P'_{si}, P_j, and the P_d's—are between 0 and 1 since they represent probabilities and changes in probabilities. The quantity $D - P_j\ B'\ (P'_{si},\ D,\ C_L,\ x_1 \ldots x_n,\ y_1 \ldots y_n)$ is positive since the average net recovery in instances where an action is brought, discounted by the likelihood that an action will be brought, is clearly less than the average amount of damages inflicted upon the victim (assuming no punitive damage recovery).

At this point, several factors can be isolated that make the B_e for one offense greater than the B_e for another, and thus make possible a comparison of relative market efficiency in allocating resources for the prosecution of the offenses. The most important factor is

deterrence. As the P_d's increase, B_e increases without any corresponding effect on B_p. Thus, with all other factors equal, the market is least efficient for those offenses deterred the most by the prosecution of offenders. Two other factors clearly affecting B_p/B_e are the number of potential offenders and the average number of offenses committed by each offender. If other factors are equal, B_e increases as these factors increase, and thus the market becomes less efficient. C_L, the costs of litigation, is the final factor with a determinate effect on B_p/B_e. An increase in C_L makes B and thus B_p smaller. It also lowers the value of B′, and B_e becomes larger. The net effect, therefore, is that B_p/B_e decreases with an increase in C_L.[33]

The effects of differences in P_{si} are more difficult to determine. An increase in P_{si} has a positive influence on the B function since the average net benefits from an action increase with an increase in the probability of success. Thus, an increase in P_{si} increases B_p. But an increase in P_{si} has an indeterminate effect on B_e, as can be seen from the deterrence formulation as originally devised:

$$[P_{si}\ P_{d1i} + (1\text{-}P_{si})\ P_{d3i}] + K[P_{si}\ P_{d2i} + (1\text{-}P_{si})\ P_{d4i}]$$

Because deterrence is greater for successful actions than for unsuccessful actions, P_{d1i} is greater than P_{d3i} and P_{d2i} is greater than P_{d4i}. Thus, an increase in P_{si} would increase the entire deterrence formulation and thus B_e. But an increase in P_{si}, which would be accompanied by an increase in P'_{si}, which would tend to decrease B_e. Consequently, an increase in P_{si} has an indeterminate effect on B_e and thus on the B_p/B_e ratio.

The same indeterminacy is present with respect to the effect of D, the average damages inflicted upon the victim. An increase in D increases B_p by increasing the average damage recovery of the victim, but it also increases B_e by increasing the net social cost of the offenses that have been deterred. The effect on B_p/B_e, therefore, is unclear.[34]

To summarize, there are four factors that have determinate effects on comparative market efficiency in allocating resources for the prosecution of various offenses: the deterrent effect of a prosecution, the number of potential offenders, the average number of future offenses per potential offender, and the schedule of litigation costs.[35]

33. One other factor that has a clear effect is P_j, the probability that an offense will be followed by a prosecution. If P_j for one offense is greater than P_j for a second, with other factors equal, the average social cost caused per offense will be less for the first (since $P_jB(P_{si}, x_1 \ldots x_n, y_1 \ldots y_n)$ will be greater), and thus B_e will be less. Consequently, as P_j increases without alteration of the other factors, market efficiency increases. This is of little significance, however, since a change in P_j will always have been stimulated by a change in another variable.

34. D will have a positive effect on both B and B′. The effect on B_p/B_e then remains indeterminate.

35. It is worthwhile to look briefly at the effect of the imposition of punitive

Before examining these factors and considering various offenses in light of these factors, a theory of government misallocation must be developed.[36] As noted above,[37] there are several reasons why a representative government cannot efficiently and without bias collect, aggregate, and implement the preferences of voters regarding individual allocation decisions. Most sources of government error in the allocation of resources for the prosecution of offenses do not vary with the different types of offenses. But one significant source of error—the influence of offenders on the legislative and administrative decision-making processes—does vary among offenses. Persons who frequently commit a particular offense are apt to exert influence to limit the frequency of prosecution of those who commit the offense. Government, as a consequence, may under-allocate resources for the prosecution of these offenses.[38]

This source of government error varies among offenses in two ways. First, some offenses possess a moral stigma such that lobbying against their prosecution is effectively prohibited. For example, it is difficult to imagine embezzlers lobbying for lessened prosecution. It is much less difficult to imagine the National Manufacturers' Association working, perhaps quasi-surreptitiously, to limit products liability prosecutions. The difference between these situations is that political influence is deemed legitimate for some purposes but not for others.

Second, the relative amount of government error varies with the relative influence of the individual victims and offenders. If, for a given offense, the offender's gain from the offense is substantially less than the victim's loss, the former will have less at stake and thus presumably will exert less effort toward influencing government prosecution patterns. More significantly, as Mancur Olson has

damages on the model. Let F equal some fine imposed on defendants found liable and paid to winning plaintiffs. Then the B_p/B_e equation looks like this for a court system that imposes such fines:

$$(B(\ldots) + F)/[P_{s1}(P_{d_1 1} + K P_{d_2 1}) + (1-P_{s1})(P_{d_3 1} + KP_{d_4 1})]N[D-P_j B'(\ldots) - P_j F]$$

The deterrence variables are new ones, since they depend on the level of the fine. A positive F will increase private benefits and increase the amount of deterrence, but will decrease the benefits from deterrence, N[. . .]. Therefore, external benefits, and thus the ratio of private to external benefits, will be affected in an uncertain way by the imposition of punitive damages.

36. The following discussion in the text deals only with governmental prosecution of offenses under existing laws. Changing the substantive law is not at issue since it is an option under either public or private prosecution.

37. *See* text at notes 5-8 *supra.*

38. One cannot speak of "good" forces that balance the offenders' influence in the political process and lead to efficiency. That is because these "good" forces—citizens wishing to combat offenses—are merely part of an efficient governmental process under the view, invoked here, of government as a quasi-market body that merely transforms proper citizen preferences into policy. Anything influencing government other than citizens working for their legitimate preferences will tend to result in error relative to this "efficient" process.

pointed out in *The Logic of Collective Action*,[39] large groups seeking collective goods, goods with largely external benefits, will not succeed in obtaining the goods as well as smaller groups seeking similar goods because the free-rider problem will be more severe for the former. Political pressure groups, Olson demonstrates, fit into this analysis. Thus, small pressure groups of a given total power will work more effectively than large groups of the same total power. This analysis explains why producers' lobbies are more politically significant than consumers' lobbies, despite the fact that each side has the same amount at stake in a particular controversy. Its significance in this context is that a small group of frequent offenders or victims is more likely to be influential than a larger group of minor ones. Thus, relative size of victim and offender is a significant variable here.

In sum, governmental misallocation of resources for the prosecution of an offense is influenced by the moral stigma attaching to the offense and the relative size and thus political influence of the offender and the victim.[40]

IV. Allocating the Prosecutorial Function

The second model developed above is admittedly abstract and cannot, absent empirical input, yield concrete conclusions that might lead us to change current policy. One way to operationalize such a model is to estimate the variables using rigorous quantitative techniques. For instance, regression analysis could be employed to uncover the factors that influence deterrence. For lack of sufficient empirical data, this Note employs a more casual analysis, filling in the variables by a series of informed guesses. These speculations suggest some useful policy initiatives and highlight some fruitful prospects for further, more sophisticated, investigation.

Of the determinants isolated above that influence market and governmental efficiency in allocating resources for prosecutions, deterrence is the one that must first be examined. The likelihood that a potential offender will be deterred by a particular prosecution appears to turn on five factors: first, the amount of resources that the potential offender devotes to information-gathering, which affects the likelihood that he will learn of the prosecution; second, whether he weighs costs and benefits carefully before committing an offense; third, his degree of risk aversion; fourth, whether he is a habitual offender; and, fifth, the "moral severity" of the offense that he potentially will commit.[41] These factors must be understood in order to compare offenses according to their P_d factors.

39. *See* M. Olson, The Logic of Collective Action 60-66, 125-48 (1965).

40. *See also* text at notes 5-8 *supra*.

41. *See generally* F. Zimring & G. Hawkins, *supra* note 10, at 98-118.

The first factor influencing the deterrent effect of a prosecution is the amount of resources devoted by the average offender to gather information about prosecution trends. This factor is in large measure a function of the number of offenses the offender commits and the value to him of committing an offense. The more offenses that a potential offender is likely to commit and the more he gains from each, the greater the likelihood that he will be prosecuted and that he will, because of a prosecution, be forced to forgo committing future profitable offenses. Consequently, the greater the total value to the offender of the offenses he commits, the more money he optimally will spend to avoid the harm from prosecution;[42] that is, the more he will spend trying to avoid being prosecuted and, if prosecuted, convicted. One aspect of ensuring safety from prosecution involves informing oneself about the likelihood of prosecution. An offender must understand the extent of the danger before he can act profitably. In short, more is optimally spent in gathering information where total offenses are monetarily more significant.

This factor, in an understandable manner, distinguishes offenses on the basis of the average benefit to the offender of committing an offense. In a manner less clear and in need of further explication, the factor distinguishes offenses on the basis of the number of offenses committed. The amount of resources committed to information-gathering could vary with the number of offenses of a particular kind that are committed by a whole "industry," without regard to the characteristics of individual offenders. Or, it could vary with the number of offenses of a particular kind committed by each individual offender.[43] That the last of these two variations is correct is not difficult to demonstrate. Suppose there are ten instances of defective products manufactured each year and ten instances of misrepresentation, and that the prospects for harm to offenders from prosecution are the same per offense for both industries. Assume also that the costs of providing information about the prospects of prosecution are the same for both. Assume finally that one offender commits all ten "products liability" torts while ten different people commit the acts of misrepresentation.

In which industry is more information gathered? One might argue that, if the productivity from information-gathering is the same for the two industries, each industry will expend the same amount. Assuming that each of the two offenses is equally beneficial to the

42. As characterized by Becker in *Crime and Punishment: An Economic Approach*, 76 J. POL. ECON. 169 (1968), this is a cost-minimizing situation. One minimizes total cost by minimizing the sum of the cost from that activity and the cost of preventing the activity. The optimal amount of prevention is that amount at which the marginal cost of prevention equals the marginal cost of activity.

43. Note that, while the resources devoted to information-gathering depend on the number of offenses committed per "industry," the information actually gathered, as the following discussion in the text points out, may not.

offender, the optimal amount spent per offense will be the same in each industry, $X, and thus the manufacturer of defective products will spend $10X and each misrepresenter, $X. Optimally, the misrepresenters will not duplicate their efforts. Instead, a firm will come into being to provide the information they need, the $10X will be paid to the firm, and each misrepresenter will receive the firm's total product of information for the price of $X. This total product will be the same as gathered by the single manufacturer of defective products since the revenue to the information-gatherer is the same in each case.[44]

This optimal situation, however, is unlikely to occur. The information firm can supply the same information to all ten misrepresenters because information is a "social good": *A*'s use of the information does not preclude *B*'s use of it. But for this very reason, the firm will not be able to maintain its market. When its information is sold to misrepresenter *A*, he may sell it himself to *B* at a price less than $X. And *B*, in turn, may sell it or even give it to *C*. This problem, similar in effect to the free-rider problem, means that a market may not exist that is sufficiently profitable for an information-gathering firm to come into existence. Even if such a firm does arise, it may not face the same demand for its product, and thus will not gather as much information, as does the single manufacturer of defective products who does not have these transaction problems.

The relevant variables isolated by this first factor for determining which offenses are most easily deterred, therefore, are the number of offenses committed by the average offender, the benefit to the offender of committing an offense, and the resources the offender has available for information-gathering. Large, frequent offenders committing profitable offenses will spend more on information-gathering, learn more, and thus be more deterrable.

The relationship between the frequency with which an offender commits an offense and his deterrability probably is not continuous, for threshold effects are likely to exist. If an offender has few resources to devote to information-gathering, he may be limited to efforts such as acquiring information by word of mouth, reading periodicals of mass circulation, and perhaps personal library research, measures that for many offenses may not be worthwhile. Effective measures, notably hiring attorneys to investigate the chances of prosecution thoroughly, require resources beyond the means of many offenders.[45] One time, infrequent, and even frequent but small offend-

44. The solution may be more complex depending on the nature of the demand curve for information on the part of these firms, but the statement in the text is at least roughly true.

45. The government and "public" agencies, like law reviews, publish information relevant to offenders, but it is not organized and analyzed sufficiently to be of use to an offender in making his decision. General Motors, for example, still needs lawyers

ers, therefore, might for some offenses be lumped together in the category of having no worthwhile information available to them. For such offenses, large, highly active offenders are likely to be the only offenders at all well informed. A small restauranteur, for example, probably does nothing to investigate his chances of being sued for spoiled food even though he may be a fairly frequent offender. Changes in the local climate are therefore unlikely to affect him.

Very active offenders have another advantage that ensures them more information than others. Such offenders may supply a large enough fraction of the total "market" for a given offense that trends in prosecution will become apparent simply from the prosecutions that they themselves face. General Motors lawyers, for example, know about trends in products liability prosecutions without having to research the issue.

The second factor relevant in determining the relative deterrability of particular offenses is the care employed by offenders in weighing the costs and benefits from offending. If offenders for a particular offense do not consider the benefits and the costs of committing the offense before acting, the prospect of a greater penalty will not deter them. The better an offender understands the costs and benefits from a given act, the more likely he is to respond to a change in those parameters.

This second factor can be broken down into several separate elements. One threshold element is that an offender must analyze his activities. In Zimring's terms, he must be reflective rather than impulsive.[46] If an offender does not reflect on the impact of his activities, even past activities, he will never have considered their costs. Another element is whether an offender attempts to quantify costs and benefits. Quantification need not be precise, but even rough quantification is more accurate than mere estimates of costs as being "high" or "low." The more detailed an offender is in quantifying costs and benefits, the more likely he is to notice and respond to cost and benefit changes. A third element is whether an offender plans ahead, whether he is "future-oriented" in Zimring's jargon.[47]

This second factor singles out most clearly those offenses that grow out of an offender's economic activity. Businessmen tend to analyze future actions because of their habitual use of accountants and accounting procedures and their need to justify projects to investors and lenders. Large organizations are particularly analytical because their project decisions, more institutionalized and impersonal, are based less on individual judgments and more on numbers

to read the law review articles and government statistics, to talk to people in government, and to collate this data to define the problems facing General Motors.

46. F. ZIMRING & G. HAWKINS, *supra* note 10, at 106-08.

47. *Id.* at 98-99.

and hard data. Regular forecasts and plans assure that large organizational offenders are future-oriented. A distinction must be drawn, however, between a business or businessman who commits offenses in the regular course of business and a person who commits business offenses. The former is one whose business activities incidentally include the commission of offenses. He may well evaluate offending as just another business decision, and, if so, the above analysis applies. The latter offender, characterized by one committing a large scale sales fraud or perpetrating a land fraud scheme, is quite different. His decision to offend is probably not made with the aid of accounting procedures or institutionalized planning since it is an initial decision rather than a decision made in the context of a series of business decisions. Such an offender cannot be expected to engage in a careful evaluation of costs and benefits before acting.[48]

The third factor in determining P_a for a particular offense is the risk preferences of the offenders. Often a pattern of committing offenses is "risky" in that there is some possibility of large resulting losses. An offender risks having to reimburse the victim for the damages he suffers, which may be well in excess of the offender's profit from offending, and he also risks having to pay litigation expenses. A series of such losses from several offenses may be catastrophic, and the possibility of catastrophic loss will exist even though the offender's profit from offending exceeds his expected prosecution losses.

Different offenders will view this schedule of possible losses differently. Some will be "risk averse" in the sense that they will base their decisions not on the expected value of their activities[49] but rather on the possibility of catastrophic losses. Risk averse offenders will tend to be more affected by a change in the likelihood of prosecution than will those who base their decisions on expected value because the likelihood of catastrophic losses is more affected by such a change than is the value of expected losses.[50] A numerical example illustrates this point. Suppose an offender faces a 50 per cent chance of 1 and a 50 per cent chance of 2 prosecutions against him in a given period. For each prosecution, he faces a 33

48. Such an offender would be more reflective than, say, an ax murderer, but crimes of passion seem in general to possess the evidentiary problem and thus are not included within this analysis.

49. "Expected value" is a statistical term meaning, roughly, the "average" prospect in a situation. If I engage in a coin-flipping game where I win $1 if the coin comes up heads and lose $1 if it comes up tails, the expected value of the game is ½ times 1 minus ½ times 1 equals 0. The expected value of the game is that I will break even. There is a risk, however, that I will lose.

50. Strictly speaking, this is true only for distributions, like the normal one, that have low frequencies at the extremes and higher ones near the median. But intuition suggests that this is almost certainly the case here. It is considered to be the case in most social populations.

per cent chance of winning the suit, a 33 per cent chance of settling for half of the plaintiff's damages, and a 33 per cent chance of losing. For the sake of simplicity, litigation costs are ignored and losses are measured as 0, 5, and 10, respectively. Thus the offender faces a probability distribution of his possible losses. There is roughly a 22 per cent chance that he loses nothing during the period, and a 5½ per cent chance that he loses 20. The expected value of his losses is 7½.[51] Suppose the chance of prosecution goes up so that there is a 50 per cent chance of two suits and a 50 per cent chance of three. The chance of losing 20 or more has risen to 24 per cent, or an increase by a factor of 4. The expected loss value, however, has risen only 67 per cent, to 12½. The implications of this difference are clear. A risk averse party, one who bases his actions primarily on the chance of losing a large amount (20 in this case), will be affected by the change in prosecution far more than one who simply relies on expected values. Thus, more deterrence results from an incremental increase in the probability of prosecution where offenders for a particular offense are risk averse.

Recent economic literature convincingly shows that large corporations are typically risk averse.[52] In *The New Industrial State*, Galbraith argues that the large industrial corporation is impelled by the large capital investments and long lead time required by modern technology to plan accurately far ahead and to keep uncertainty to a minimum.[53] Large losses and surprises cannot be tolerated because adjustments to deal with them cannot be made on short notice. The Galbraith argument suggests that, because the termination of a loss-incurring program might be slow and costly, a large firm will be averse to a program that might engender a large number of losing suits. Robin Marris concludes that large corporations are risk averse on the ground that corporate managers, motivated primarily by their own survivial, run corporations to minimize the danger of large losses and thus takeover bids: they fear the chance of severe losses much more than they desire big gains.[54]

It may also be true that risk aversion varies among individuals according to their income levels. One who is poor may be a risk preferrer because he has very little to lose and the bankruptcy and welfare laws limit the consequences of his failures. On such an individual, an incremental increase in the probability of prosecution may have little effect.

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51. Disregarding, of course, the offender's earlier gains from offending.

52. *See, e.g.*, K. BOULDING, RECONSTRUCTION OF ECONOMICS 26-38 (1950); Grabowski & Mueller, *Managerial and Stockholder Welfare Models of Firm Expenditures* in REV. ECON. STAT., Feb. 1972, at 9-20.

53. *See* J. GALBRAITH, THE NEW INDUSTRIAL STATE 11-178 (1967).

54. R. MARRIS, THE ECONOMIC THEORY OF "MANAGERIAL" CAPITALISM 29-45 (1964).

The fourth factor affecting P_d is a simple one. P_d is the diminished probability of an offender's continuing to offend. If an offender acts once, from impulse or for peculiar reasons, and is unlikely to repeat, P_d may be small simply because there will be little likelihood of repetition even without prosecution. Thus, whether the average offender for a particular offense is a habitual one influences P_d.

The final factor affecting P_d is the moral seriousness of the offense. The responsiveness of offenders to a change in the probability of prosecution should vary inversely with this factor. If an offense is considered highly reprehensible, most people will be barred by their ethical beliefs from committing it and a small change in the expected costs of offending will not affect their decisions. But, if an offense is viewed as having little moral significance, many will base their decision whether to offend on the chance of prosecution.

It is at this point possible, after analyzing the five main factors that influence deterrence, to list the characteristics that make an offense most suitable for governmental prosecution. An offense is an attractive one for governmental prosecution if (1) there are a large number of potential offenders, (2) each offender commits a large number of offenses, (3) offenders are large, active, and financially able to gather information, (4) offenders are reflective or commit offenses in the regular course of business, (5) offenders are risk averse, as are large businesses and perhaps individuals in upper income brackets, (6) the offense is not one that is particularly morally reprehensible, and (7) the offense involves complicated trials with complex issues of law and fact and thus leads to high litigation costs.

While various offenses will rate differently on this list of considerations, the list does seem to single out as the most suitable for governmental prosecution those offenses that are committed frequently by a large number of financially strong businesses, expensive to litigate, and not morally reprehensible. The prosecution of such offenses will create large external benefits and will thus have a low B_p/B_e ratio, which means that, absent government intervention, the market will allocate considerably less than the optimal amount of resources for prosecution.

Yet, as noted above, governmental misallocation is greatest for offenses that are committed by large businesses and that are not morally reprehensible, which means that governmental misallocation is severe for many of the offenses for which market misallocation is great. In the antitrust area, for example, where offenders are principally large corporations and the offense not particularly morally reprehensible, governmental misallocation is evidenced by the apparent forestalling of a number of justice department prosecutions

due to corporate political influence.[55] Thus, the fact that an offense is morally neutral and committed primarily by large corporations does not automatically mean that government will allocate resources to the prosecution of the offense more accurately than the free market will. The determination that the market will misallocate resources for the prosecution of a particular offense must therefore be followed by a balancing of the relative inefficiencies of governmental and market production.

An alternative to governmental prosecution of offenses that will be under-prosecuted by the free market is governmental subsidization of private prosecution.[56] A subsidy program would only increase private prosecution. Even if the decision concerning the amount by which prosecutions should be subsidized were influenced by politically oriented offenders, a subsidy program would not augment existing market underallocation. Thus, while governmental misallocation renders it impossible to determine whether, for a particular offense, governmental prosecution would be better than private prosecution, governmental misallocation does not affect the decision whether an offense is an appropriate one for governmental subsidization. It is therefore possible to state that an offense insufficiently prosecuted in the market, like an offense involving large business offenders, is a strong candidate for governmental subsidization.

Five common offenses can at this point be ranked according to their relative suitability for market prosecution and governmental subsidization of private prosecution. While the ranking will be rough and far from rigorous, it should serve to hint at what can be achieved by using the model here developed fortified by more empirical knowledge.

The five offenses considered are antitrust violations, manufacturers' products liability offenses, interference with contract, sales fraud, and embezzlement. Sales fraud and embezzlement, and to some extent antitrust violations, are now prosecuted by the government. An examination of the five offenses for the characteristics isolated above suggests that two of these three—sales fraud and embezzlement—are *not* the most appropriate offenses for governmental prosecution or subsidization.

Antitrust violations are the most appropriate of the five offenses for governmental action. Because violations are highly significant

55. M. GREEN, THE CLOSED ENTERPRISE SYSTEM 30-47 (1972).

56. The subsidy would be a bonus paid by the government to individuals who prosecuted successfully, and would be received by the individuals in addition to the damages awarded by the court. The size of the bonuses would roughly equal the external benefits from prosecution. A bonus equal to external benefits would mean that the successful prosecutor would receive an amount equal to *all* the benefits generated by the prosecution. Thus there would be sufficient inducement for the optimum amount of prosecution to be achieved.

in dollar terms,[57] there is an incentive for potential offenders to be well-informed as to the possibilities of prosecution. Potential violators are reasonably large in number and are principally large firms[58] that presumably expend a vast amount of resources on planning. Many potential offenders are therefore probably also risk averse. Antitrust violations characteristically take years and cadres of lawyers to prosecute; thus, litigation costs are high. Finally, antitrust violations are probably not regarded by the business community as immoral.[59] Because the antitrust laws and their justification are still a matter of controversy, it is reasonable to surmise that most potential offenders are willing to offend if the risks are small enough.

Products liability offenses are second in terms of their propriety for governmental subsidization. The number of potential offenders is large, each is apt to commit a large number of offenses, and problems of proof may make the costs of litigation significant. Moreover, offenders risk the possibility of large losses since the costs of being prosecuted for products liability often include enormous personal injury judgments. Thus, offenders have incentives to be well-informed. Finally, products liability violations may possess little moral significance, principally because offenses are unintentional. A firm becomes an offender by using slightly less thorough manufacturing or testing procedures and accepting a slightly greater probability that defective products will be produced. Because there is always some finite probability of defectives, it is easy to consider such actions as morally neutral. Yet defective products often cause serious injuries. Some firms may thus take great care to avoid producing defective goods whatever the chance of prosecution. The only factor that reduces the attractiveness of products liability offenses for governmental action is the size of the potential offenders. While many of the offenders are apt to be large, aware of prosecution trends, reflective, and risk averse, many offenders may be small businesses with little risk aversion and little institutionalized planning.

Little that is certain can be said with respect to the third offense, interference with contract. Presumably, few businessmen induce breaches of contract as a regular procedure and thus few have any real incentive for staying well-informed concerning the offense. While offenders will generally be businesses there is no a priori reason to believe that any particular proportion are large corporations.

57. Defendants are liable to private plaintiffs for treble damages. 15 U.S.C. § 15 (1970). Remedies can also include divestiture. *See* United States v. Aluminum Co., 91 F. Supp. 333 (S.D.N.Y. 1950). Plainly a divestiture order can cause an offender significant damage.

58. *Cf.* P. AREEDA, ANTITRUST ANALYSIS xxix-li (2d ed. 1974) (citing cases).

59. *See generally* F. SCHERER, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 158 (1970).

The offense is probably not considered highly immoral by many, although some might avoid committing the offense on ethical grounds. There are a large number of potential offenders, but most offenders probably commit few offenses. Finally, the costs of litigation are normally not particularly high since contract actions are not among the more complex. In sum, interference with contract is not suited clearly for either market or governmental treatment, and is, accordingly, ranked in a rough manner in the middle of the five offenses.

The fourth offense, sales fraud, encompasses schemes specifically designed to sell tangible or intangible items under false pretenses or in misleading ways. The offense is defined here to exclude cases that involve the evidentiary problem. Offenders may be active on a large scale or they may be small operators who cannot afford to spend what is necessary to discover the chances of prosecution. Because offending is not part of a regular business, planning cannot be expected and, accordingly, offenders are not likely to be risk averse. Offenses are probably regarded as highly immoral. Thus, there will be few potential offenders on the margin of offending. Over-all, there are few external benefits flowing from a sales fraud prosecution, and therefore there is little reason for governmental prosecution or subsidization.

Embezzlement, the final offense, has fewest of the characteristics that make an offense an attractive candidate for governmental action. There are probably few offenders active enough to make systematic information-gathering worthwhile. Due to the nature of the offense, there are no large corporate offenders and offenses are not committed in the context of corporate decision-making. Because offenses are generally viewed as highly immoral, the number of potential offenders is not high, although some offenders may be habitual or reflective. In sum, embezzlement, assuming that it does not possess the evidentiary problem, provides the weakest case for governmental aid of any of the five offenses considered. Yet, along with sales fraud, it is the one predominantly prosecuted by the government.

This analysis suggests some changes in policy. Whether the government should intervene in the prosecution of all these offenses or none of them is a question beyond the scope of this Note. But, if the above analysis has any validity, the present pattern of governmental intervention seems improper to the extent that government does not focus on large corporate and business offenders committing morally neutral offenses. Extending and improving the approach used here could reveal more inconsistencies in public policy regarding the agent of prosecution.